

CITY OF ELGIN

WATER SYSTEM IMPROVEMENT PROJECT

PHASE 1, 1974

1,000,000 GAL. RESERVOIR

CITY COUNCIL

WARNER L. STEIN, MAYOR

JESSIE McDONALD

ROBERT L. ROSE

THOMAS GRANT

CARREL R. HURST

ARLEE MYERS

BETTY KNAPP

CITY OFFICIALS

RONALD D. SCUBES, CITY RECORDER

HELLEN EVERS, CITY CLERK

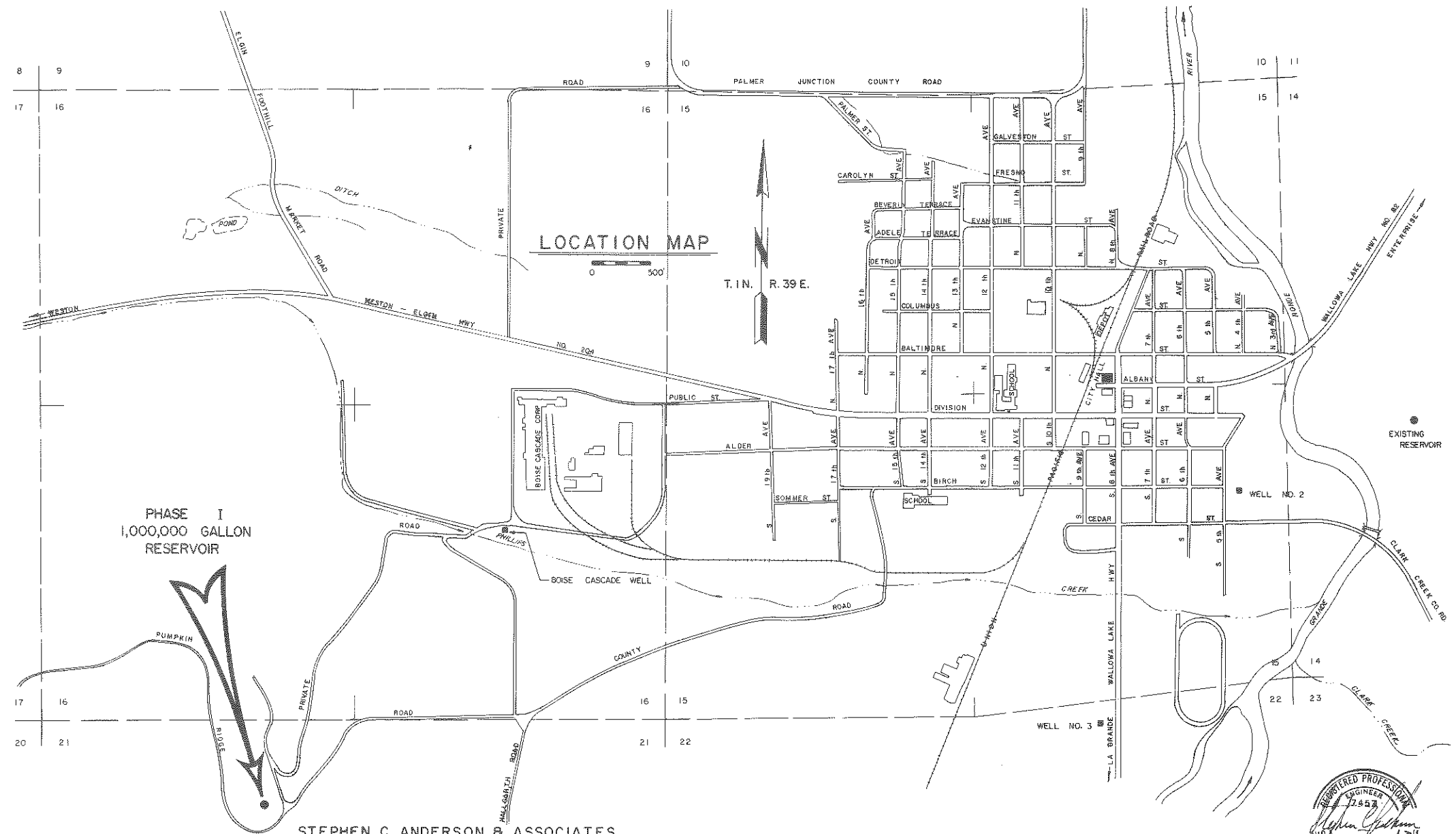
NORMAN E. BROWN, WATER & STREET SUPERINTENDENT

TOM SPIKES, ASSISTANT WATER AND STREET SUPERINTENDENT

BEN LUSE, FIRE CHIEF

KENNETH DELONG, POLICE CHIEF

WARNER WASLEY, CITY ATTORNEY

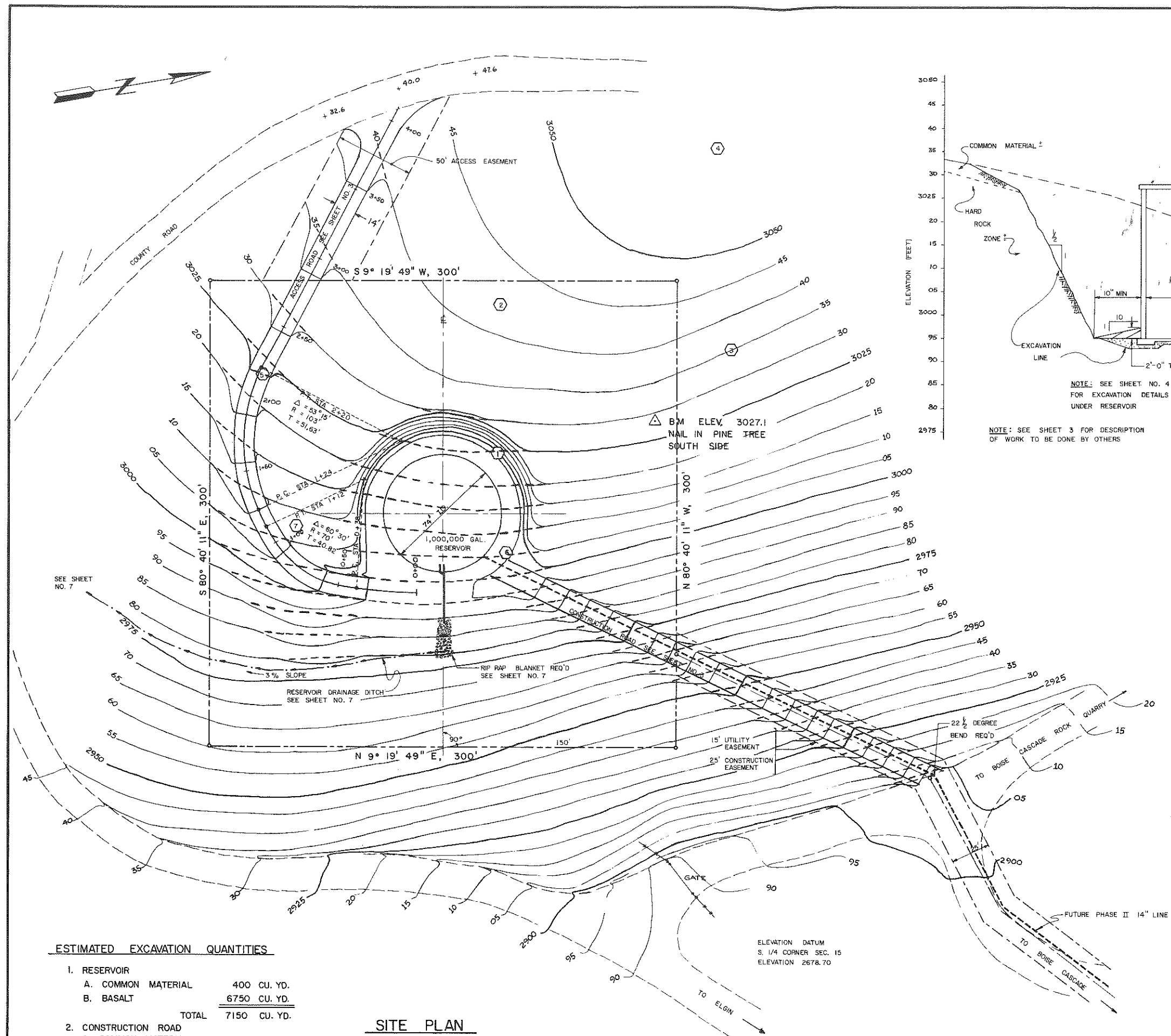


STEPHEN C. ANDERSON & ASSOCIATES

CONSULTING CIVIL ENGINEERS
LA GRANDE OREGON



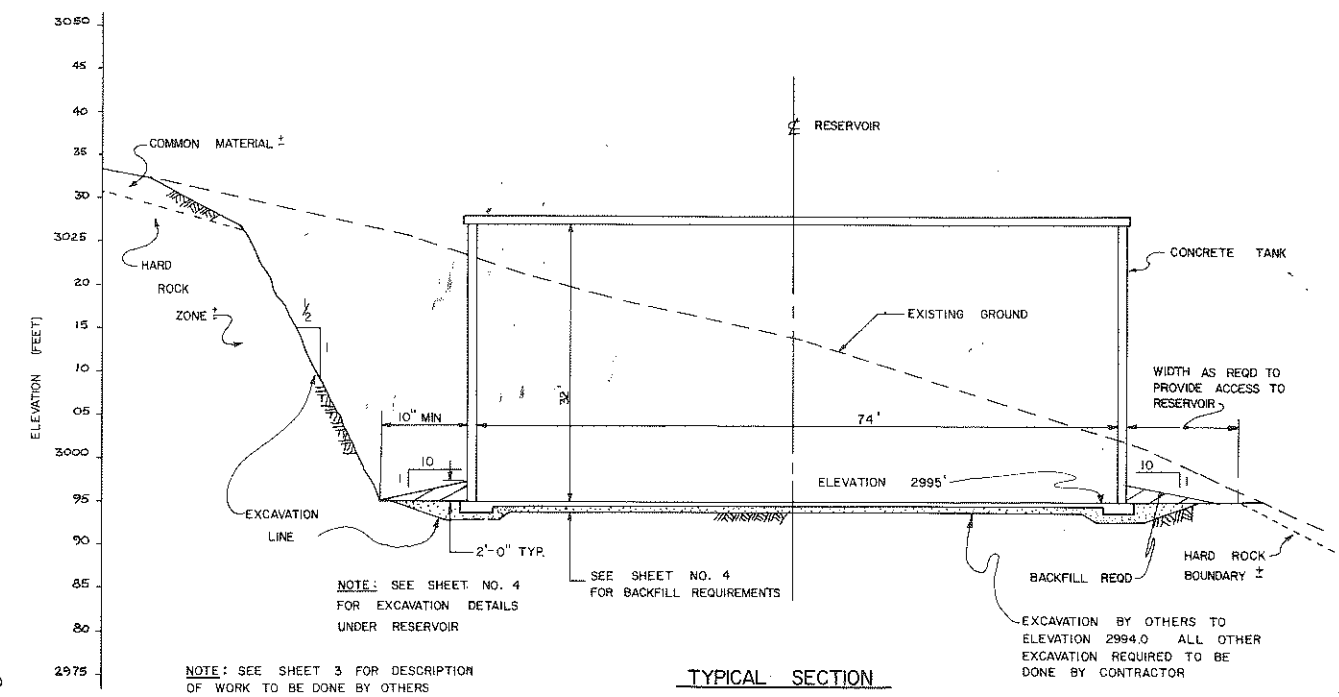
REVISED NOV. 1974



ESTIMATED EXCAVATION QUANTITIES

1. RESERVOIR		
A. COMMON MATERIAL	400 CU. YD.	
B. BASALT	6750 CU. YD.	
TOTAL	7150 CU. YD.	
2. CONSTRUCTION ROAD		
A. COMMON MATERIAL	150 CU. YD.	
B. BASALT	40 CU. YD.	
TOTAL	190 CU. YD.	

SITE PLAN



TYPICAL SECTION RESERVOIR SITE EXCAVATION



LOG OF TEST PITS

B = BOULDERS

DEPTH (FEET)	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7
0	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.	BROWN SILT with BASALT B.
1	FRACTURED BASALT	FRACTURED BASALT	FRACTURED BASALT	FRACTURED BASALT	FRACTURED BASALT	FRACTURED BASALT	FRACTURED BASALT
2	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT
3	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT	HARD BASALT

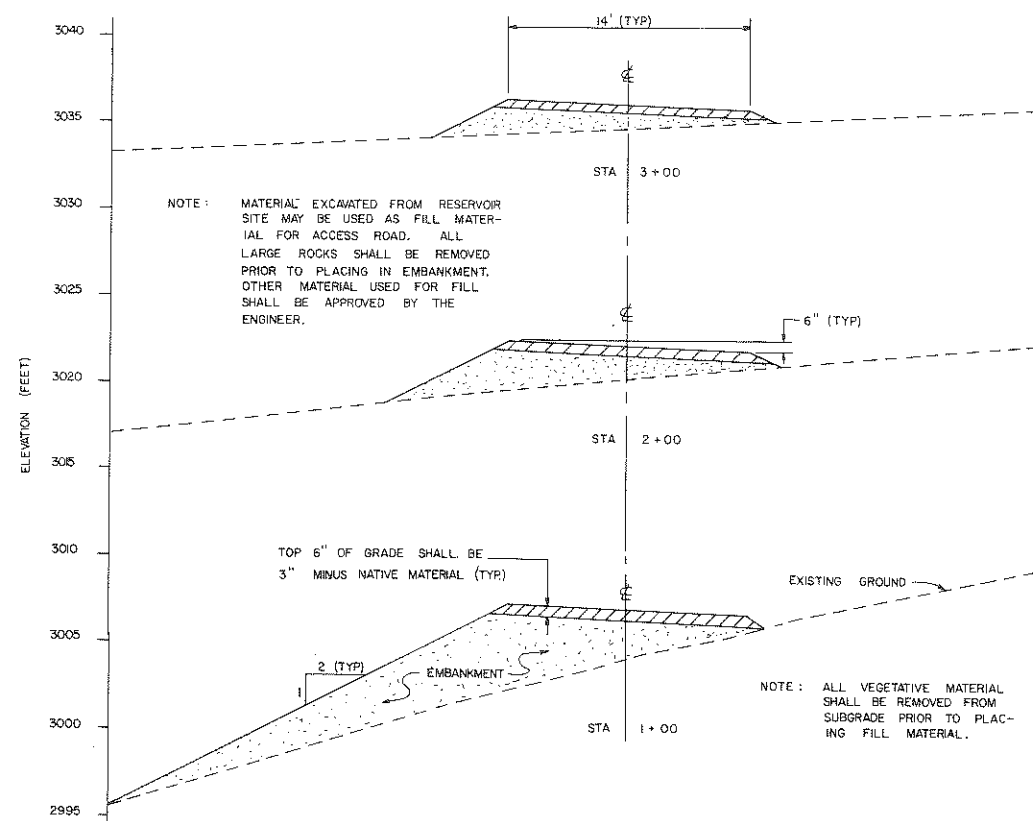
LEGEND

- (1) TEST PIT
- CITY OF ELGIN PROPERTY LINE
- EXISTING ROAD
- 25' UTILITY EASEMENT
- o STEEL PIN
- ORIGINAL GROUND
- EASEMENT LINE
- FUTURE 14\"/>

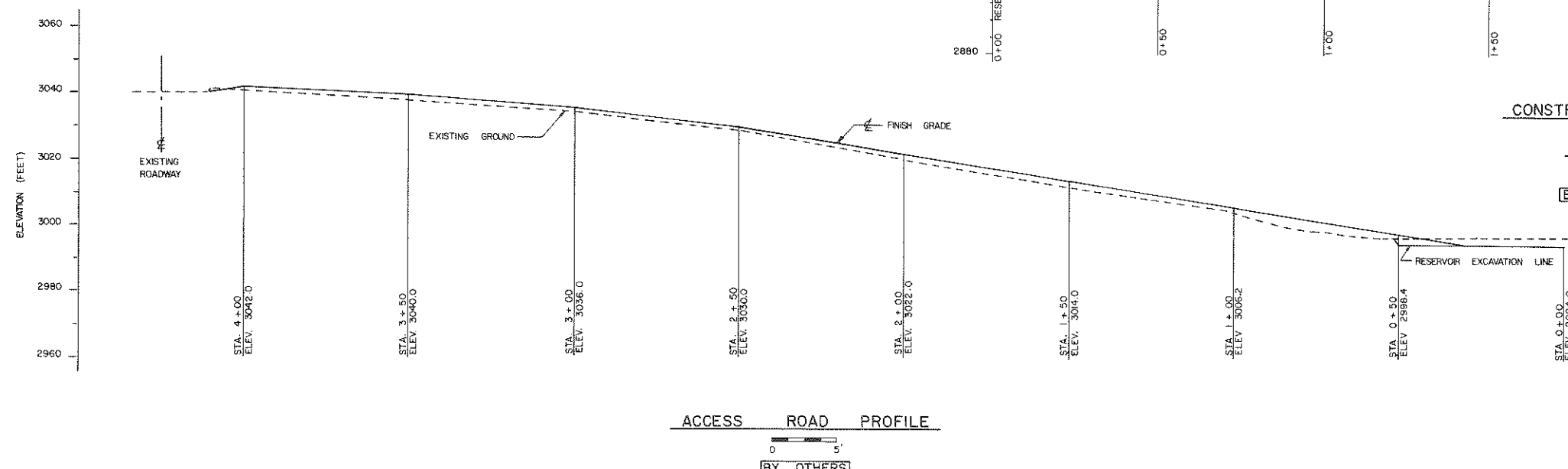


CITY OF ELGIN		
WATER SYSTEM IMPROVEMENTS		
PHASE 1, 1,000,000 GAL. RESERVOIR		
RESERVOIR SITE PLAN		
AS SHOWN	STEPHEN C. ANDERSON AND ASSOCIATES	2
JUNE, 74	LAGRANDE, OREGON	

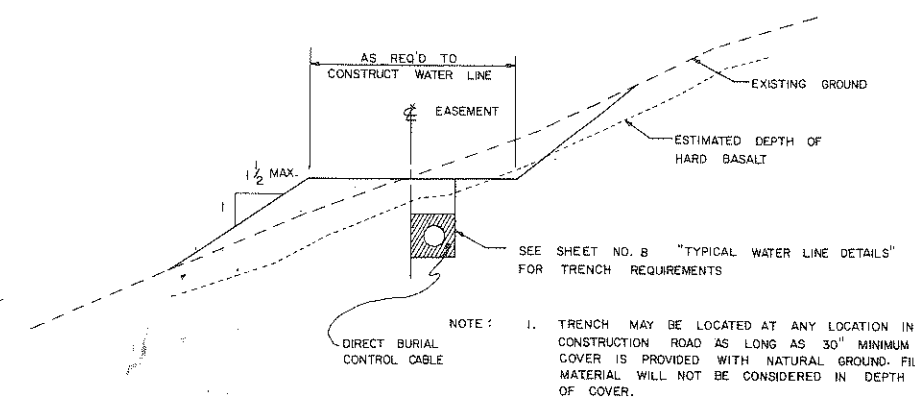
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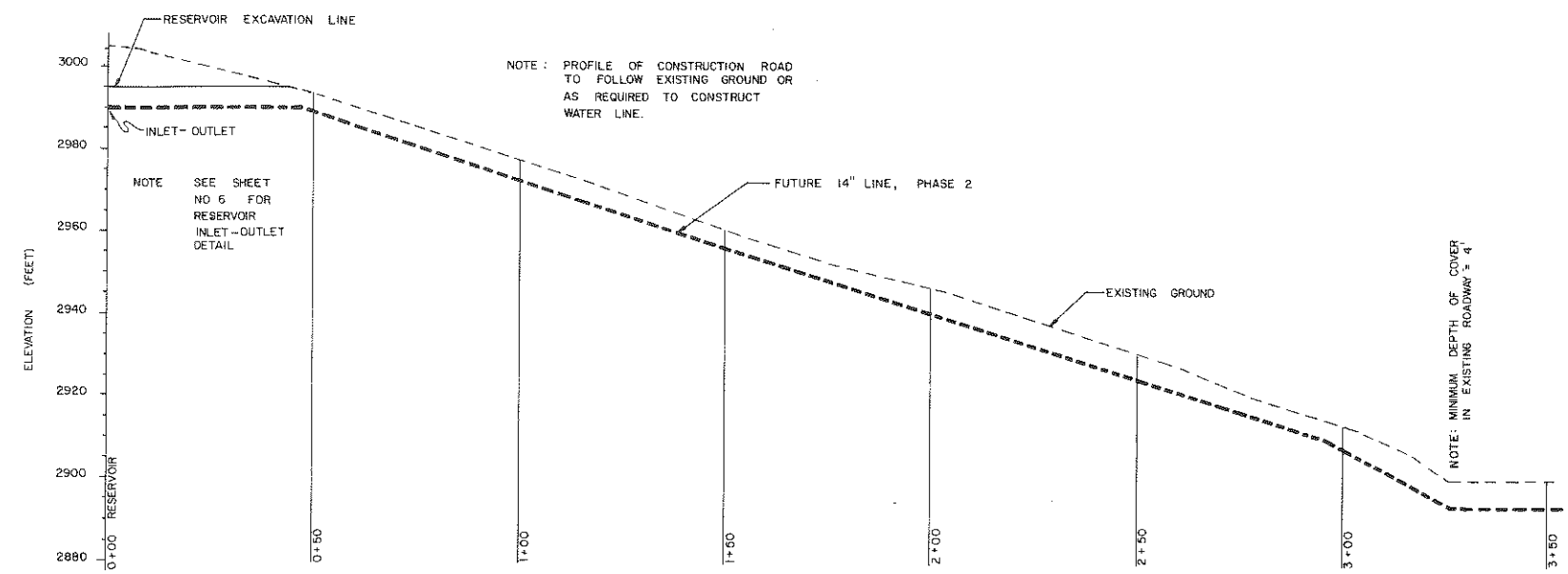
TYPICAL SECTIONS
ACCESS ROAD
BY OTHERS



ACCESS ROAD PROFILE
BY OTHERS

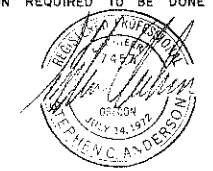


TYPICAL CROSS-SECTION OF CONSTRUCTION ROAD
BY OTHERS



CONSTRUCTION ROAD
PROFILE
BY OTHERS

- NOTE: A. THE FOLLOWING WORK WILL BE DONE BY OTHERS BY MARCH 1, 1975
1. EXCAVATION OF RESERVOIR SITE TO ELEV. 2994.0
 2. CONSTRUCTION OF "ACCESS ROAD"
 3. CONSTRUCTION OF "CONSTRUCTION ROAD"
 4. EXCAVATION OF PIPE TRENCH IN CONSTRUCTION ROAD
 5. CONSTRUCTION OF "DRAINAGE DITCH"
 6. CONSTRUCTION OF "RESERVOIR DRAINAGE ROADWAY CROSSING"
- B. ALL PIPING REQUIRED TO BE DONE BY CONTRACTOR
- C. ALL OTHER EXCAVATION REQUIRED TO BE DONE BY CONTRACTOR



CITY OF ELGIN WATER SYSTEM IMPROVEMENTS PHASE 1, 1,000,000 GAL. RESERVOIR		
TYPICAL CROSS-SECTIONS		
SCALE AS SHOWN	STEPHEN C. ANDERSON AND ASSOCIATES	SHEET NO. 3
DATE JUNE, 74	LA GRANDE, OREGON	

REVISED NOV. 1974

NOTES

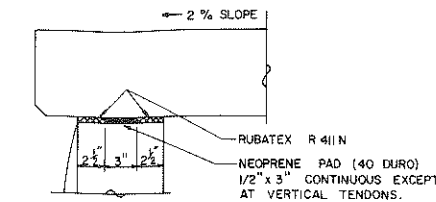
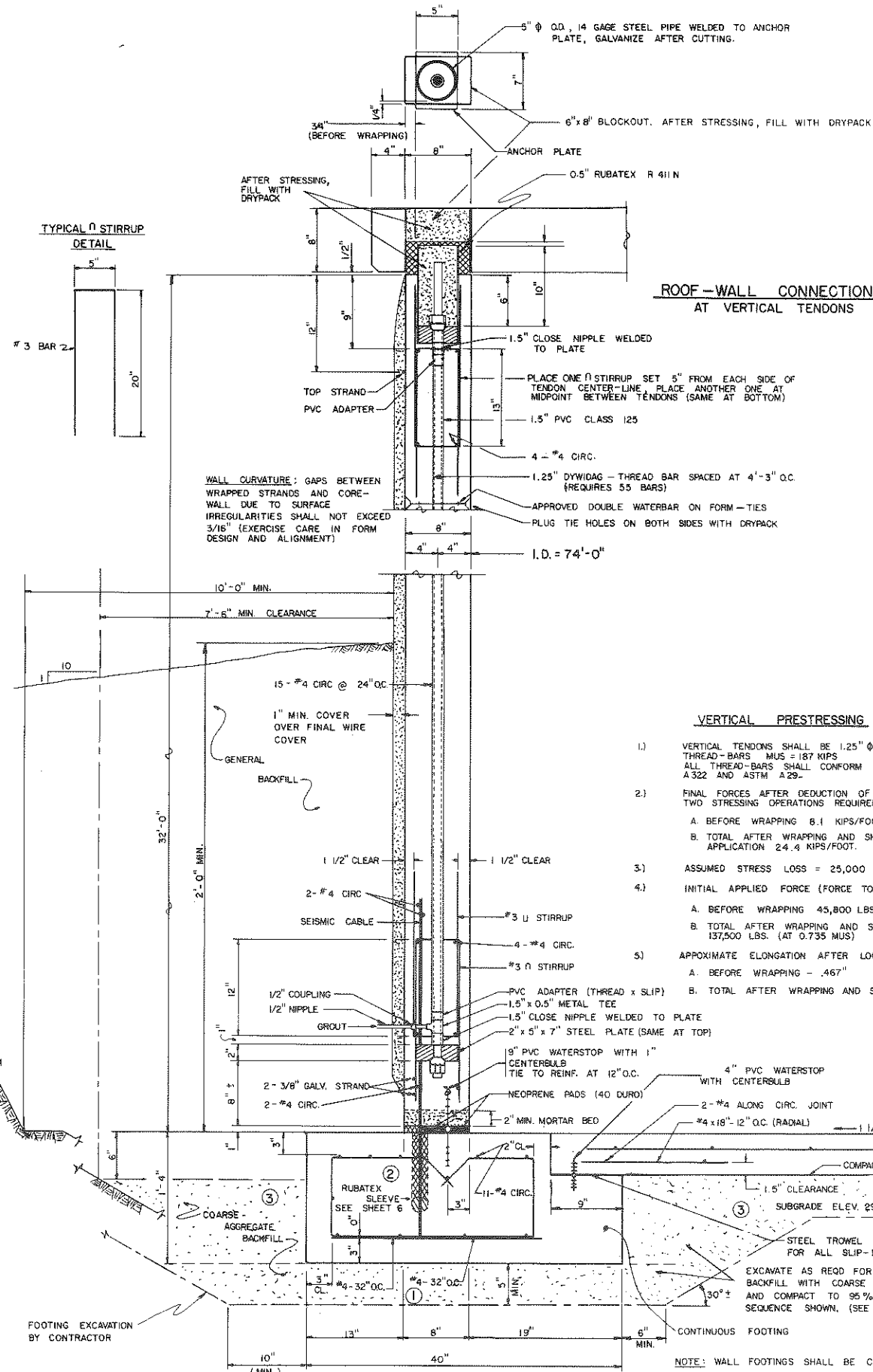
- ALL MISC. METAL, NUTS, BOLTS, AND WASHERS SHALL BE EITHER CADMIUM PLATED OR HOT DIPPED GALVANIZED.
- ALL BOLTS, NUTS, WASHERS IN DIRECT CONTACT WITH WATER SHALL BE STAINLESS STEEL.
- ALL GALVANIZED METAL MUST BE HOT DIPPED GALVANIZED AFTER ALL FABRICATION HAS BEEN COMPLETED.
- MINIMUM 28 DAY CONCRETE STRENGTH: WALL, COLUMNS, AND ROOF = 4,000 PSI (7 SACKS/CY MIN.)
ALL OTHER CONCRETE = 3,000 PSI (6 SACKS/CY MIN.)
- MEMBRANE CURING NOT PERMITTED ANYWHERE EXCEPT CONCRETE WALLS.
- HORIZONTAL COLD JOINTS IN CORE WALL NOT PERMITTED; SHOULD UNFORESEEN COLD JOINTS DEVELOPE, PLACE 2" MORTAR BED OF 1:1 C/S MIX BEFORE CONTINUING WALL POUR.

WATERSTOP REQUIREMENTS

LOCATION	WIDTH	LBS. PER 100 FT.	CENTERBULB	
CONSTRUCTION JOINTS IN WALLS	6"	72	NONE	ALL WATERSTOPS TO BE TIGHTLY SEALED TOGETHER AT ALL INTERSECTIONS AND JOINTS
EXPANSION JOINTS IN FLOOR	4"	60	3/8" I.D.	
EXPANSION BETWEEN WALL & WALL FOOTING	9"	230	1" I.D.	
BETWEEN COLUMN FOOTING & FLOOR	4"	60	3/8" I.D.	

CIRCUMFERENTIAL PRESTRESSING

- CIRCUMFERENTIAL STRANDS SHALL BE 3/8" ϕ GALVANIZED SEVEN WIRE STRANDS HAVING A MUS OF 21,400 LBS.
- ASSUMED STRESS LOSS 25,000 PSI.
- INITIAL APPLIED FORCE:
 - MINIMUM = 0.72 MUS OR 15,400 LBS.
 - MAXIMUM = 0.75 MUS OR 16,000 LBS.
 - FORCE SETTING ON MACHINE = 15,700 LBS.
- TOTAL STRANDS REQUIRED = 152

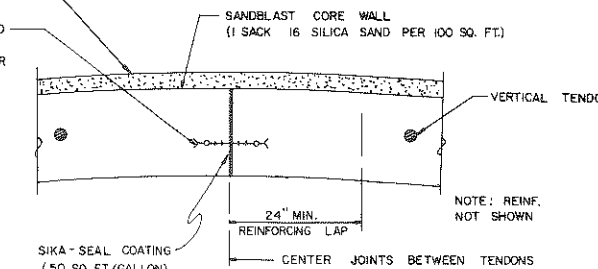


ROOF - WALL CONNECTION



ALL WALL AREAS PLACED UNDERGROUND SHALL BE PAINTED WITH TWO COATS OF SIKA-SEAL OR APPROVED EQUAL. MINIMUM COVERAGE IS 150 SQ. FT./GALLON PER COAT

TIE 6" WATERSTOP TO FORM TIES OR REBARS AT 12" O.C. (SEAL TO 9" WATER STOP AT BOTTOM)



VERTICAL WALL JOINTS

5 VERTICAL JOINTS REQUIRED

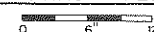


NOTE: ALL FLOOR AND FOOTING JOINTS SHALL BE SEALED WITH A MASTIC JOINT SEALER MATERIAL.

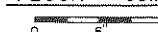
VERTICAL PRESTRESSING

- VERTICAL TENDONS SHALL BE 1.25" ϕ DYWIDAG THREAD-BARS MUS = 187 KIPS
ALL THREAD-BARS SHALL CONFORM TO ASTM A322 AND ASTM A29.
- FINAL FORCES AFTER DEDUCTION OF ALL LOSSES.
TWO STRESSING OPERATIONS REQUIRED PER TENDON.
 - BEFORE WRAPPING 8.1 KIPS/FOOT.
 - TOTAL AFTER WRAPPING AND SHOTCRETE APPLICATION 24.9 KIPS/FOOT.
- ASSUMED STRESS LOSS = 25,000 PSI.
- INITIAL APPLIED FORCE (FORCE TOLERANCE = $\pm 2,800$ LB).
 - BEFORE WRAPPING 45,800 LBS.
 - TOTAL AFTER WRAPPING AND SHOTCRETE APPLICATION 137,500 LBS. (AT 0.735 MUS)
- APPROXIMATE ELONGATION AFTER LOCK-OFF.
 - BEFORE WRAPPING - .467"
 - TOTAL AFTER WRAPPING AND SHOTCRETE APPLICATION 1.40"

WALL - WALL FOOTING - FLOOR CONNECTION

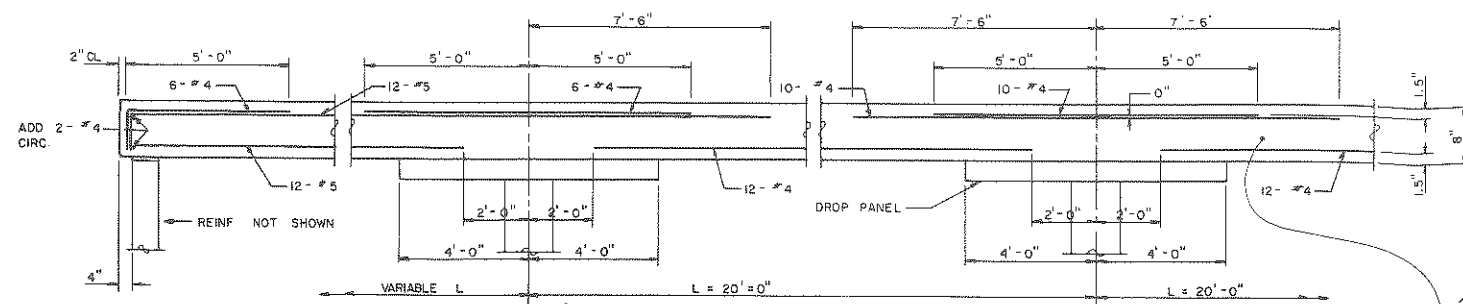


FLOOR JOINT



CITY OF ELGIN WATER SYSTEM IMPROVEMENTS PHASE 1, 1,000,000 GAL. RESERVOIR		
RESERVOIR DETAILS		
SCALE: AS SHOWN	STEPHEN C. ANDERSON AND ASSOCIATES	SHEET NO. 4
DATE: JULY '74	LAGRANDE, OREGON	

REVISED NOV. 1974

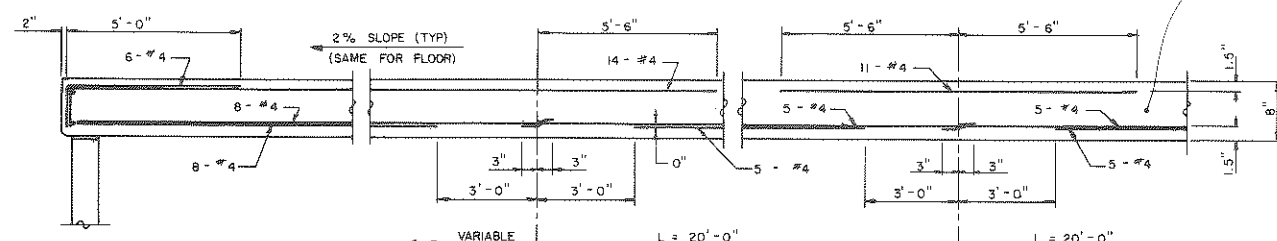


EDGE PANEL — COLUMN STRIP

INTERIOR PANEL — COLUMN STRIP

SCALE: 0 3' HORIZONTAL

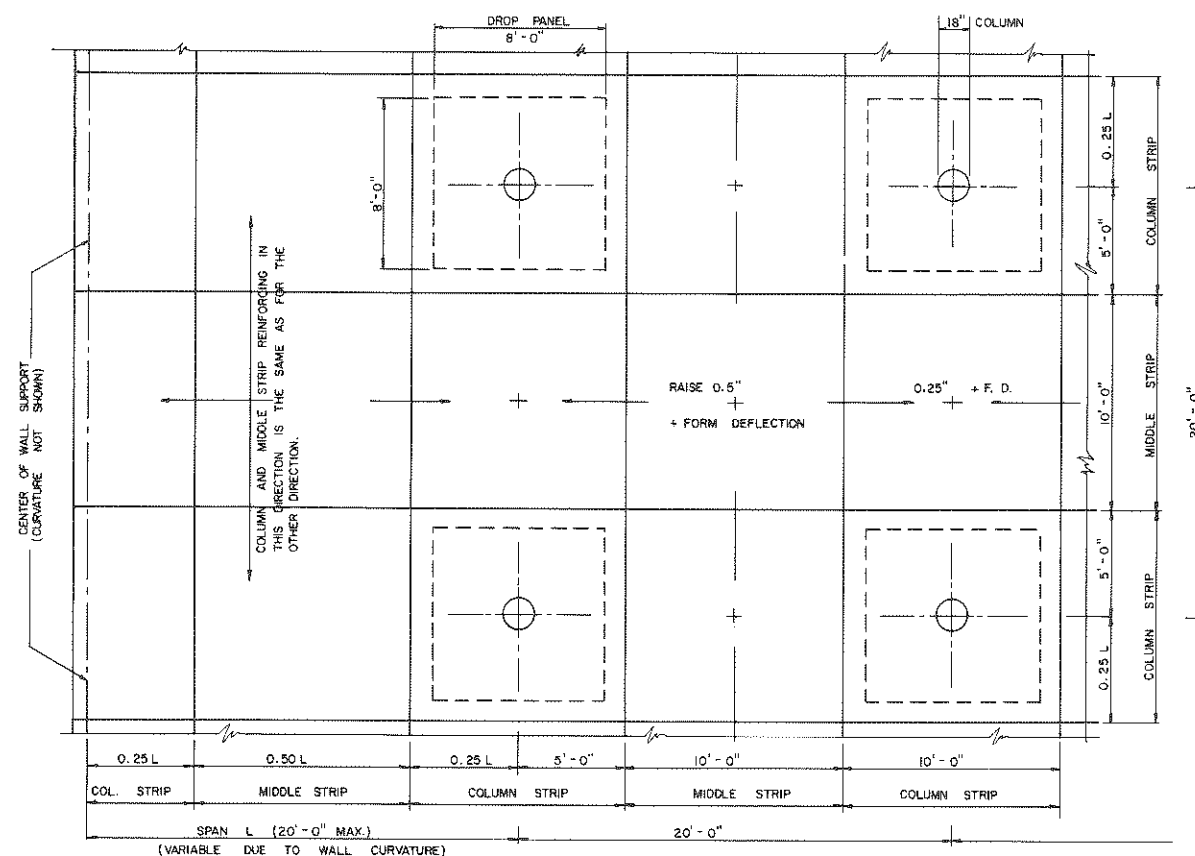
NOTE: PERPENDICULAR REINFORCING NOT SHOWN IN THESE SECTIONS BUT IS SAME AS SHOWN



EDGE PANEL — MIDDLE STRIP

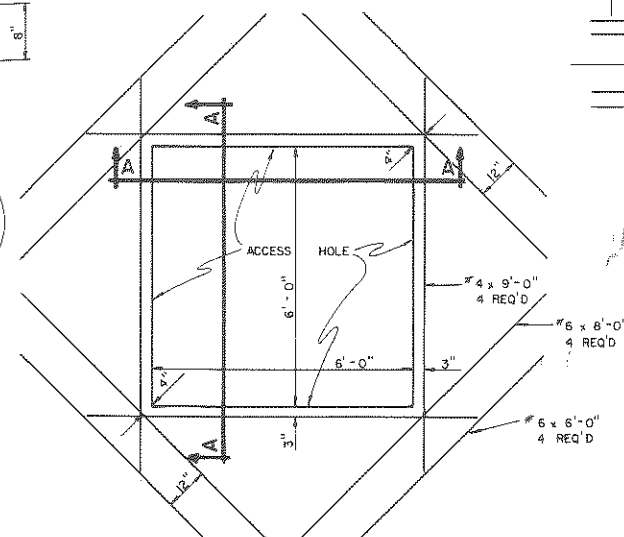
INTERIOR PANEL — MIDDLE STRIP

SCALE: 0 3' HORIZONTAL



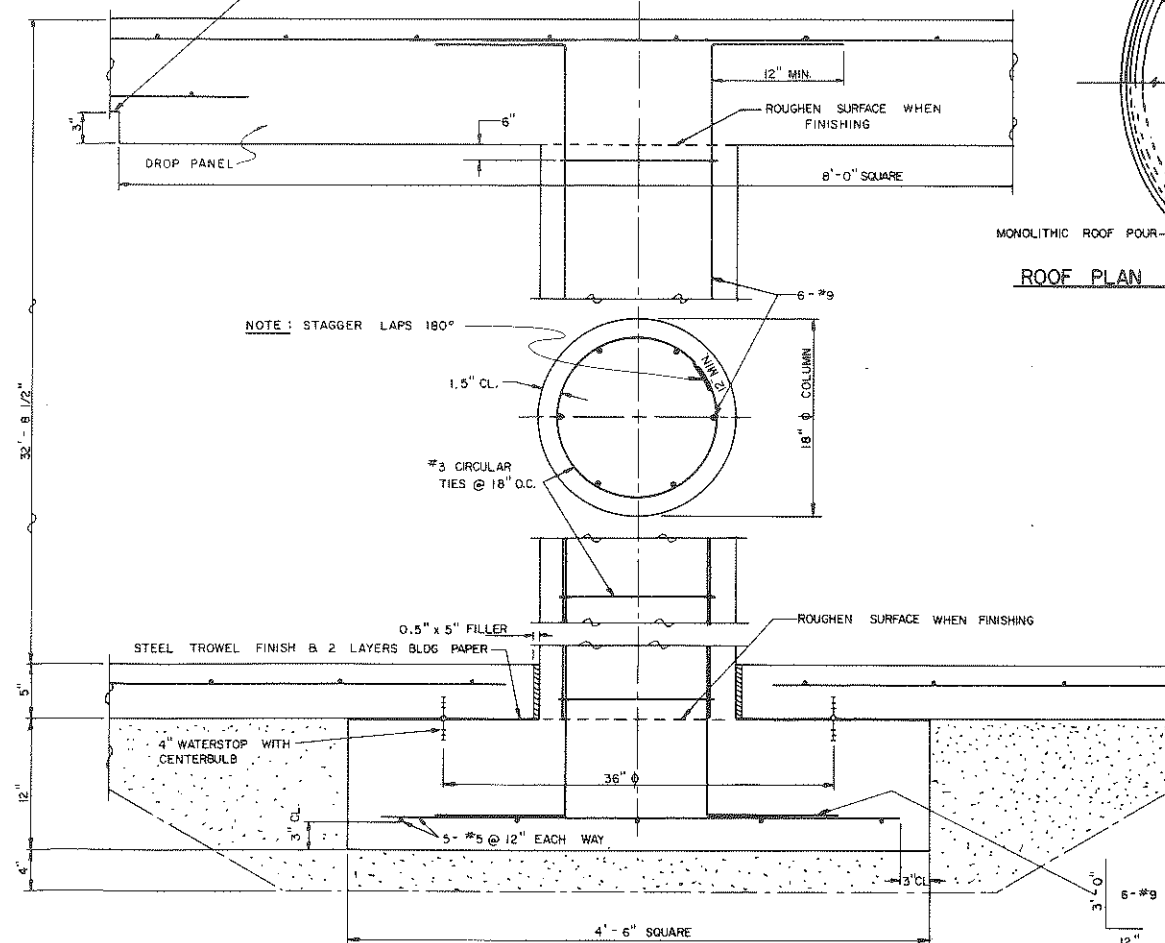
ROOF SLAB
TYPICAL PLAN

0 4'



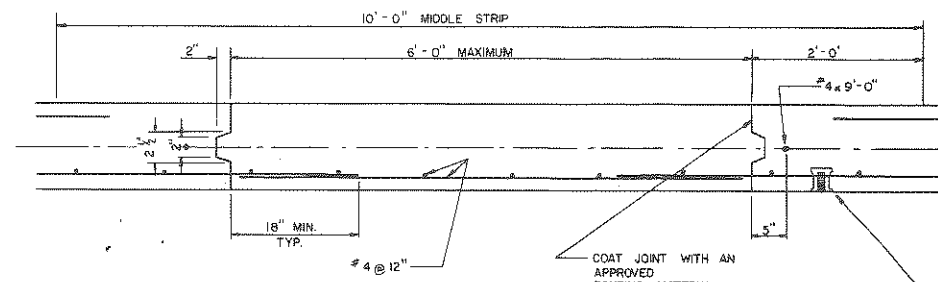
ROOF
CONSTRUCTION ACCESS HOLE

SCALE: 0 3' SYMMETRICAL ABOUT
MAXIMUM FORM DEFLECTION UNDER FULL LOAD = 1/360 OF SPAN

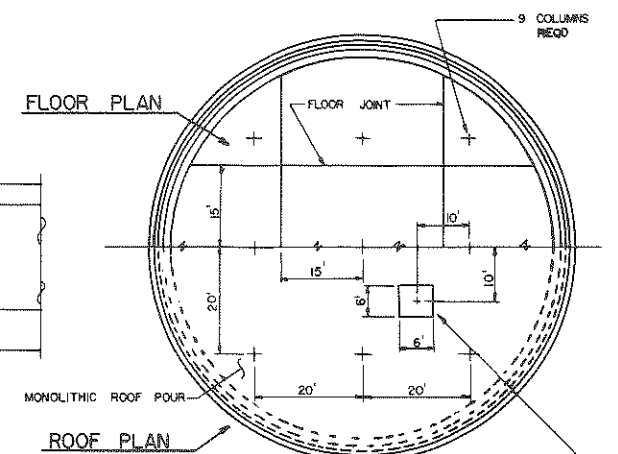


COLUMN & COLUMN FOOTING DETAIL

0 6' 12'



SECTION A-A
SCALE: 0 12" HORIZONTAL



TYPICAL LOCATION FOR CONSTRUCTION
ACCESS HOLE (MAX. NO. ALLOWED, 2)
NOT TO SCALE

NOTES

- 1.) MINIMUM CONCRETE STRENGTH = 4,000 PSI (7 SACKS PER CU. YD.)
- 2.) ALL REBARS SHALL MEET ASTM A432 OR A618 A305. (f_y = 24,000 PSI; f_y = 60,000 PSI)
- 3.) MAXIMUM LIVE LOAD ON ROOF = 40 PSF (SNOW)
- 4.) MINIMUM SOIL BEARING PRESSURE = 6,000 PSF
- 5.) 50% OF THE REBAR IN THE EDGE PANEL OF THE COLUMN STRIP MUST BE PLACED IN THE MIDDLE THIRD OF THE STRIP.
- 6.) WATER STOPS SHALL BE PLACED SO AS TO PROVIDE A CONTINUOUS WATER SEAL AT ALL JOINTS



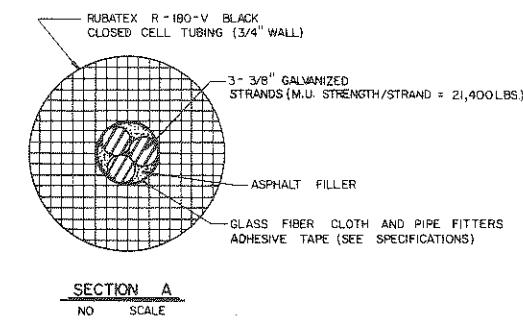
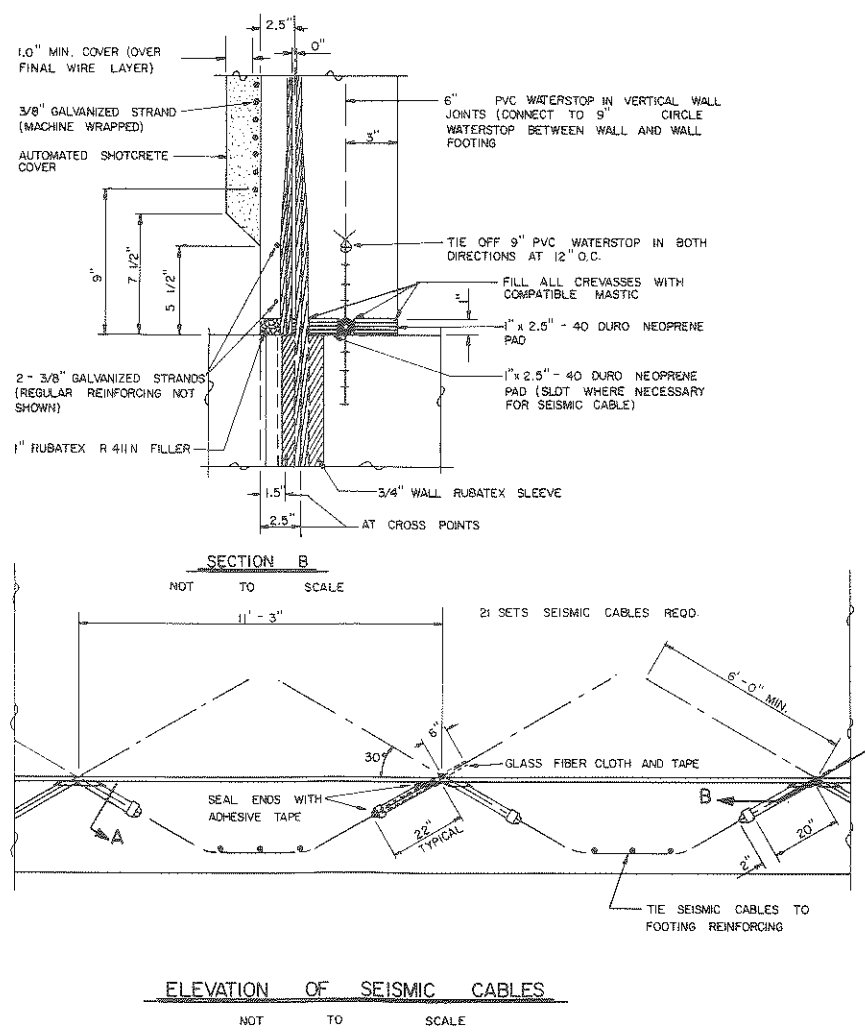
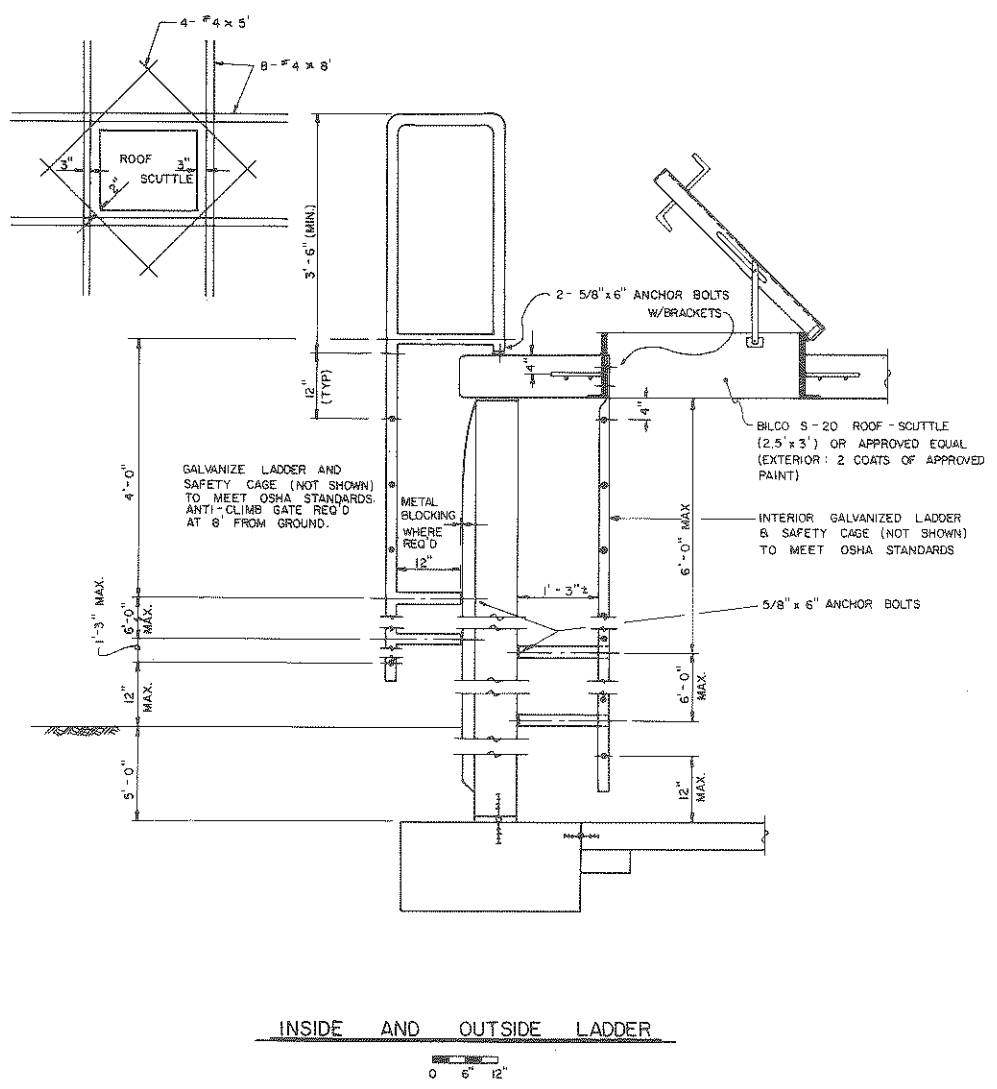
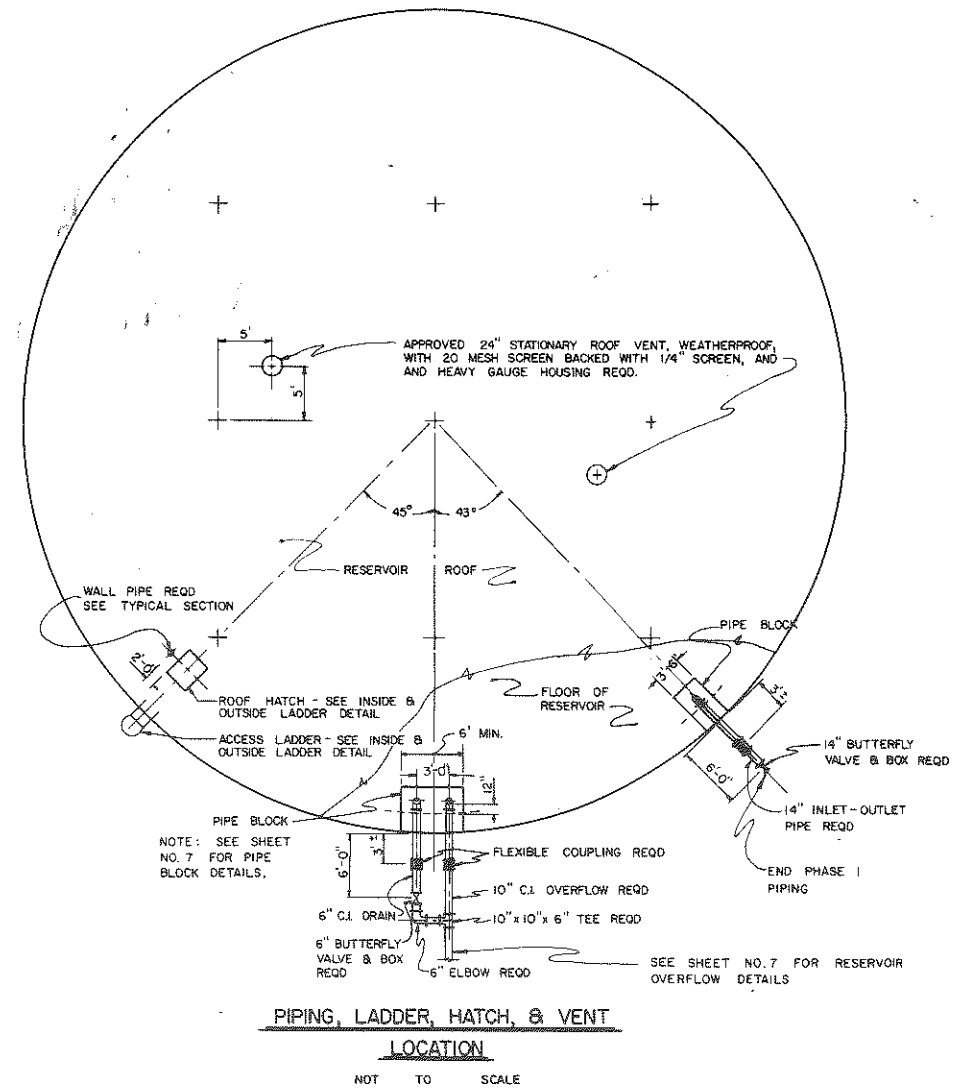
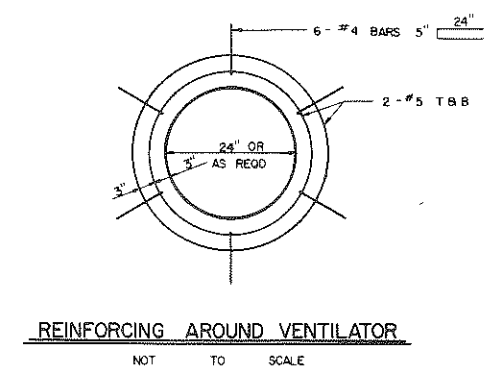
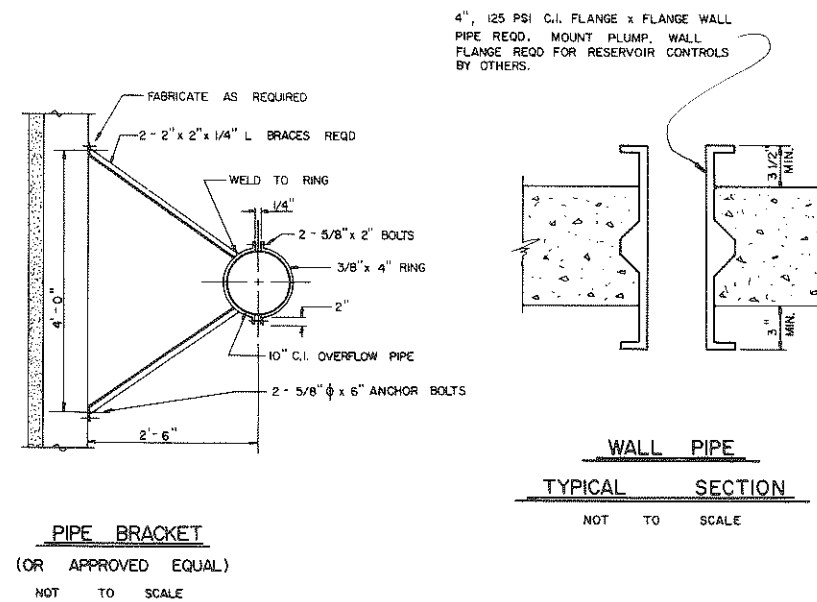
CITY OF ELGIN
WATER SYSTEM IMPROVEMENTS
PHASE 1, 1,000,000 GAL. RESERVOIR

RESERVOIR DETAILS

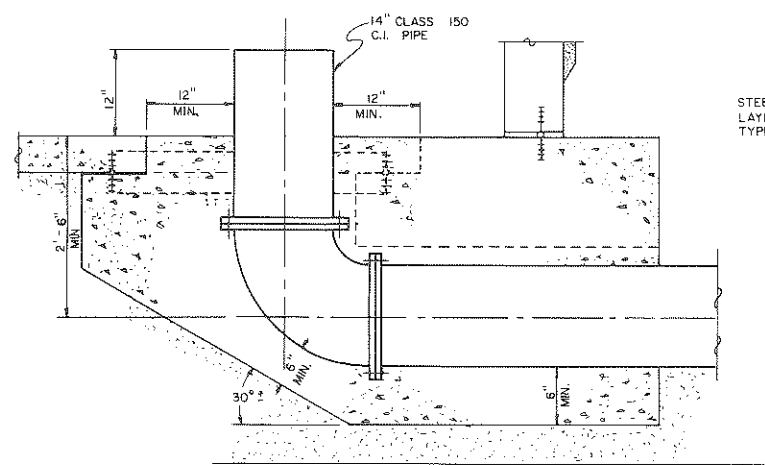
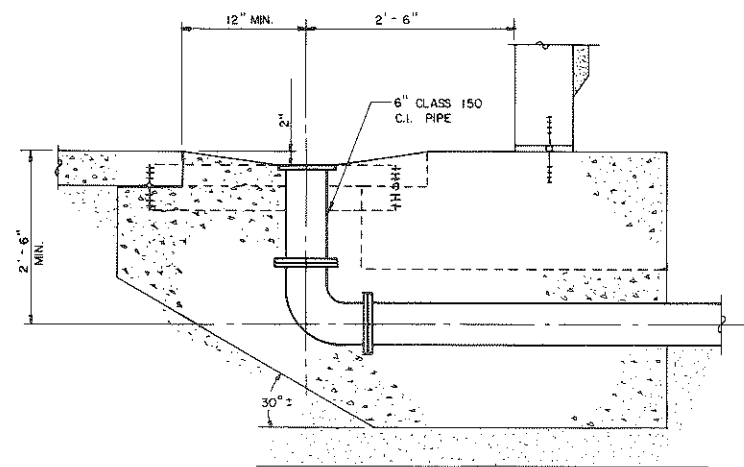
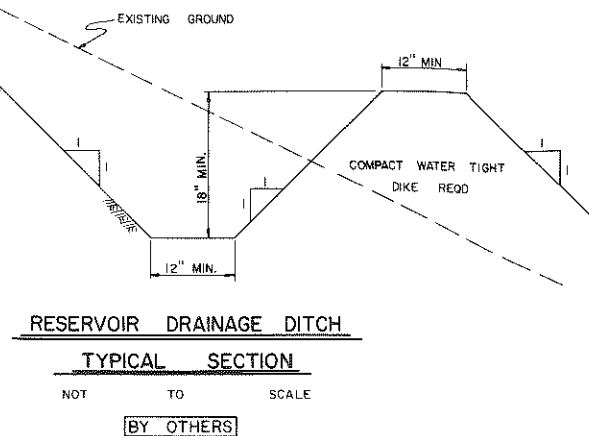
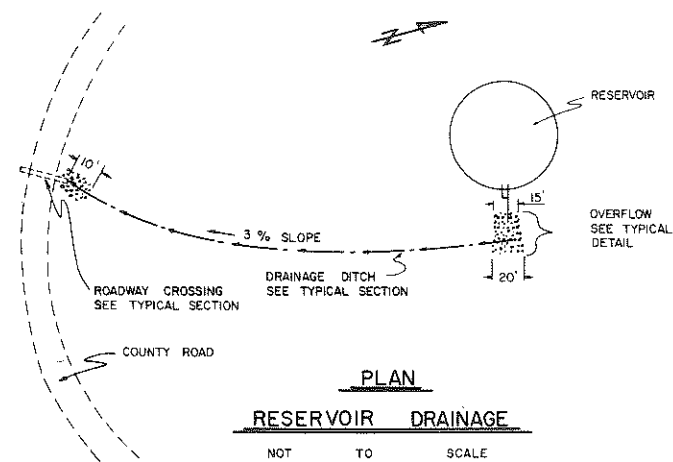
SCALE: AS SHOWN
DATE: JULY '74
STEPHEN C. ANDERSON
AND ASSOCIATES
LAGRANDE, OREGON

SHEET NO
5

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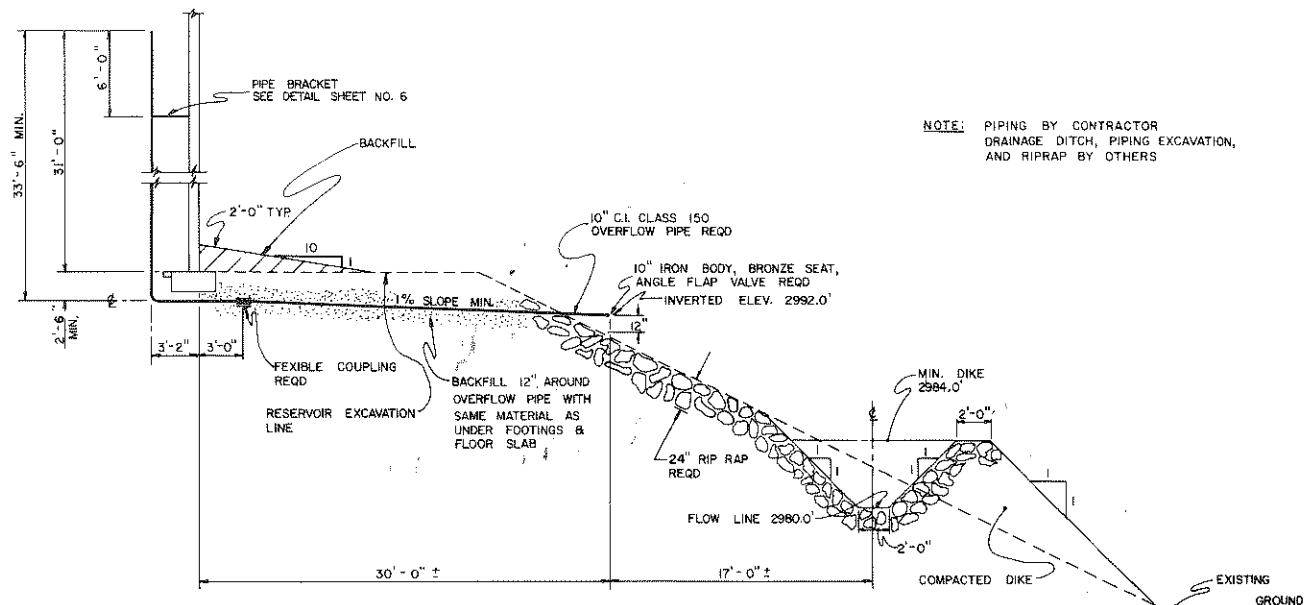
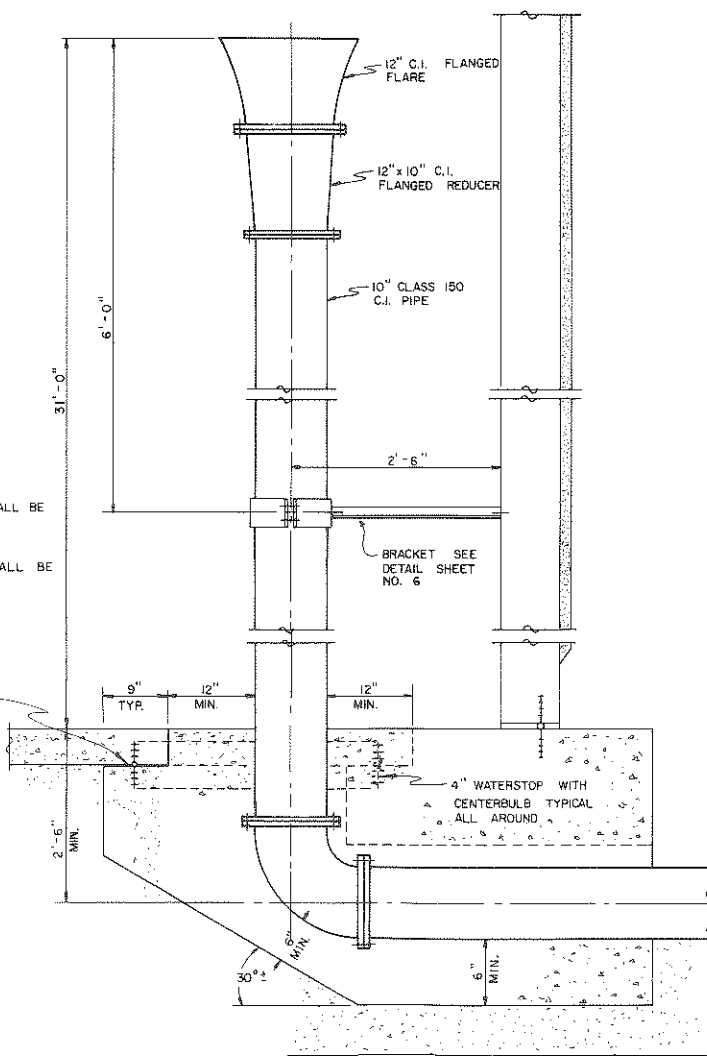


CITY OF ELGIN WATER SYSTEM IMPROVEMENTS PHASE 1, 1,000,000 GAL. RESERVOIR		
TYPICAL DETAILS		
SCALE: AS SHOWN	STEPHEN C. ANDERSON AND ASSOCIATES LAGRANDE, OREGON	SHEET NO. 6
DATE: JULY '74		

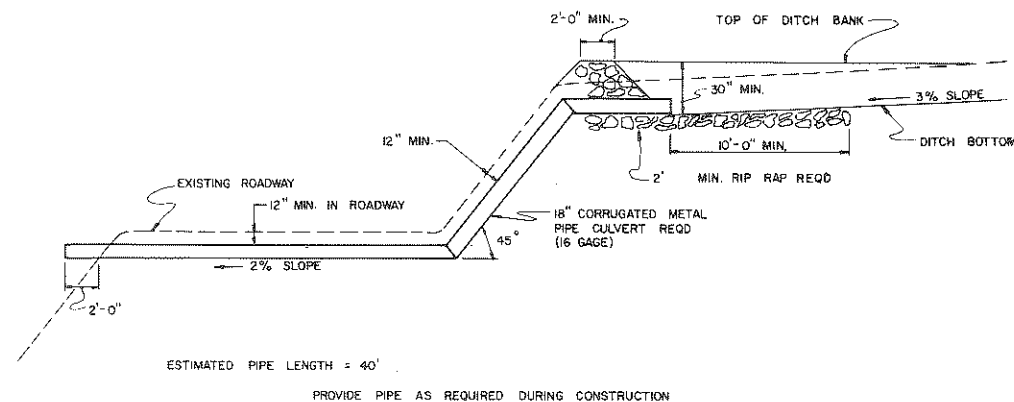


- NOTE**
- 1.) DRAIN AND OVERFLOW FOOTINGS SHALL BE POURED AS ONE. SEE PIPING LOCATION, SHEET NO. 6
 - 2.) PIPE BLOCKS AND WALL FOOTINGS SHALL BE POURED MONOLITHICALLY.

STEEL TROWEL FINISH & TWO LAYERS BLDG. PAPER REQD TYPICAL



RESERVOIR OVERFLOW & DRAINAGE DITCH
NOT TO SCALE



NOTE: EXCAVATION FOR PIPE BLOCKS AND PIPING BELOW ELEVATION 2994 BY CONTRACTOR



CITY OF ELGIN WATER SYSTEM IMPROVEMENTS PHASE 1, 1,000,000 GAL. RESERVOIR		
TYPICAL DETAILS		
SCALE AS SHOWN	STEPHEN C. ANDERSON AND ASSOCIATES	SHEET NO. 7
DATE JULY '74	LAGRANDE, OREGON	

REVISED NOV. 1974

NOTES

- 1.) THRUST BLOCKS SHALL BE REQ'D AT THE FOLLOWING LOCATIONS:
 - A.) ALL CHANGES IN DIRECTION
 - B.) ALL CHANGES IN SIZE
 - C.) ALL DEAD ENDS
 - D.) AS REQ'D BY ENGINEER
- 2.) THRUST BLOCKS SHALL BE SIZED AS REQ'D BY SOIL CONDITIONS AND OPERATING PRESSURE.
- 3.) PLACE CONC. AGAINST UNDISTURBED TRENCH WALL.
- 4.) CONC. SHALL BE 2500 PSI MIN.
- 5.) ALL CONC. SHALL BE PLACED SO THAT PIPE AND FITTING JOINTS WILL BE ACCESSIBLE FOR REPAIRS.
- 6.) ANCHOR RODS SHALL BE $\frac{3}{4}$ " DIAM. GALVANIZED STEEL RODS, HAVING A 18" MIN. EMBEDMENT IN CONC.

TABLE NO. 1

PIPE SIZE	TEES & DEAD ENDS	90 deg BEND	45 deg BEND	22 1/2 deg BEND
4"	1,850	2,610	1,420	720
6"	3,800	5,370	2,910	1,470
8"	6,580	9,300	5,040	2,550
10"	10,750	15,200	8,240	4,170
12"	15,310	21,640	11,720	5,940
14"	20,770	29,360	15,910	8,060
16"	26,880	38,010	20,590	10,430

NOTE: FOR WATER PRESSURES DIFFERENT THAN 100 psi MULTIPLY THRUST FOUND IN TABLE NO. 1 BY REQUIRED PROPORTION.

EXAMPLE: PRESSURE 175 psi MULTIPLY VALUE IN TABLE BY 1.75

DETERMINATION OF THRUST-BLOCK AREA

AREA

NOTE: WHEN THRUST BLOCK BEARING AREA IS NOT SPECIFIED ON THE PLANS OR BY THE ENGINEER THE FOLLOWING PROCEDURE SHALL BE USED TO DETERMINE REQUIRED BEARING AREA.

- 1.) DETERMINE THRUST (T) AT FITTING AS REQUIRED FOR TYPE OF FITTING, SIZE OF PIPE, AND WORKING PRESSURE FROM TABLE NO. 1.
- 2.) DETERMINE BEARING CAPACITY (B) OF SOIL FROM TABLE NO. 2.
- 3.) DETERMINE REQUIRED BEARING AREA (A) AS FOLLOWS:

$$A = T \div B$$

EXAMPLE: WORKING PRESSURE: 175 psi
PIPE: 12"
FITTING: TEE
SOIL: SANDY GRAVEL

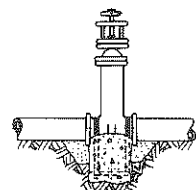
FROM TABLE NO. 1: T = 15,310 lb
FROM TABLE NO. 2: B = 3000 lb/ft²

$$A = \frac{15,310 \times 1.75}{3000} = 8.9 \text{ ft}^2$$

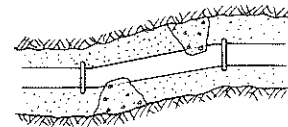
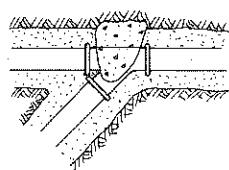
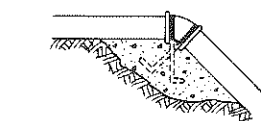
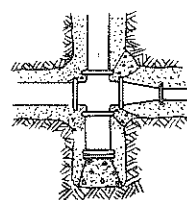
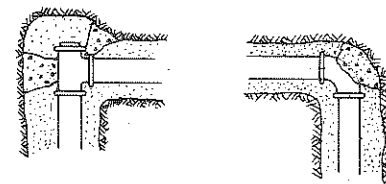
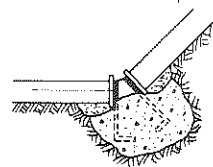
TABLE NO. 2

SOIL	SAFE BEARING LOAD lb per sq. ft.
SOFT CLAY	500
SAND	2000
SAND AND GRAVEL	3000
SAND AND GRAVEL CEMENTED WITH CLAY	4000
HARD CLAY	4000

TYPICAL LOCATIONS

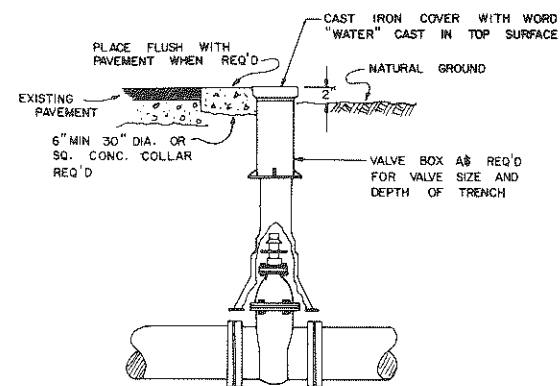


FOR 12" VALVES AND LARGER OR AS SPECIFIED BY THE ENGINEER.

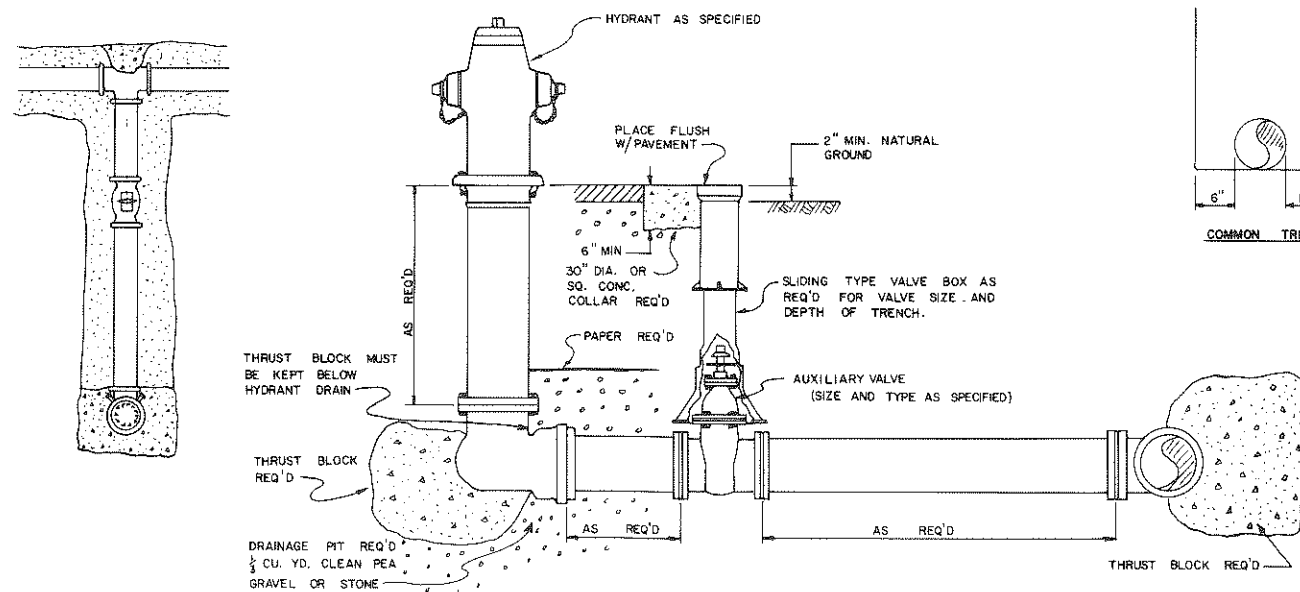


NOTES

- 1.) HYDRANT SHALL MEET LATEST SPECS OF THE AWWA (C502)
- 2.) HYDRANT REQ'D SHALL BE SPECIFIED IN PLANS AND SPECIFICATIONS.
- 3.) ROOFING OR TAR PAPER REQ'D OVER DRAINAGE PIT.



VALVE BOX DETAILS



FIRE HYDRANT DETAILS

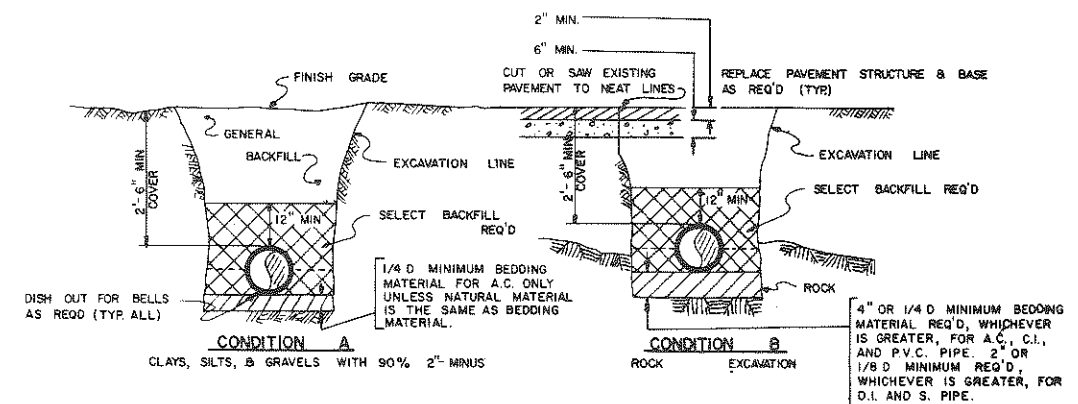
NOTES

- 1.) BEDDING MATERIAL SHALL BE APPROVED BY THE ENGINEER. ACCEPTABLE MATERIAL INCLUDES SANDS, SANDY SILTS, AND GRANULAR MATERIAL 1" OR MINUS.
- 2.) TRENCHES SHALL BE SLOPED AS REQUIRED BY SOIL CONDITIONS IN ORDER TO PROVIDE SAFE WORKING CONDITIONS IN ACCORDANCE WITH OSHA REGULATIONS.
- 3.) THE MAXIMUM TRENCH WIDTH SHALL BE 18" OR 1 FOOT GREATER THAN O.D. OF PIPE BARREL WHICH EVER IS GREATER, AND SHALL BE MAINTAINED TO TOP OF PIPE.
- 4.) ALL PIPE SHALL BE LAID IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION OR REQUIREMENTS, OR APPROPRIATE AWWA, ASA, OR FEDERAL SPECIFICATIONS WHICH EVER IS MOST RESTRICTIVE.
- 5.) SELECT BACKFILL SHALL BE TYPE A FOR A.C., P.V.C. AND C.I.; TYPE B FOR D.I. AND STEEL PIPE AS DESCRIBED BELOW.
- 6.) SELECT BACKFILL SHALL BE TAMPED IN 4" LAYERS UP TO THE HORIZONTAL DIAMETER OF THE PIPE IN ORDER TO PROVIDE FIRM BEDDING AND LATERAL SUPPORT.
- 7.) GENERAL BACKFILL SHALL BE COMPACTED AS REQUIRED BY THE ENGINEER OR SPECIFICATIONS.
- 8.) PAVEMENT STRUCTURES AND GRANULAR BASE SHALL BE REPLACED AS SHOWN OR AS REQ'D BY ENGINEER OR CONTROLLING AGENCY.
- 9.) THE CONTRACTOR SHALL RESTORE THE SURFACE TO A CONDITION EQUAL TO THAT BEFORE THE WORK BEGAN.
- 10.) WHEN ELECTRICAL CABLES ARE BURIED IN SAME TRENCH AS PIPE, SELECT BACKFILL AROUND CABLE FOR A 3" RADIUS SHALL BE 1/2" MINUS MATERIAL AS APPROVED BY THE ENGINEER.

SELECT BACKFILL

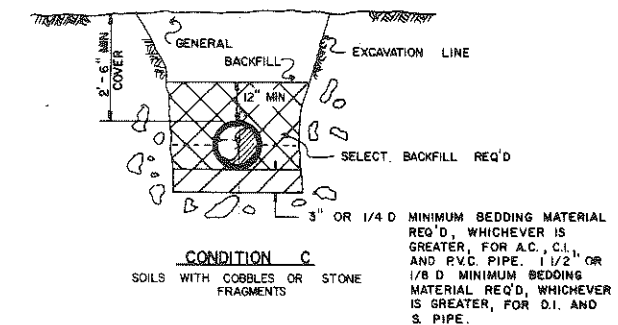
A.C. = ASBESTOS CEMENT
P.V.C. = POLYVINYL CHLORIDE PLASTIC
C.I. = CAST IRON
D.I. = DUCTILE IRON
S. = STEEL

GENERAL: SHALL BE FREE OF DRY LUMPS, FROZEN MATERIAL, OR ANY OTHER UNSUITABLE MATERIAL.
TYPE A = 1 1/2" MINUS MATERIAL
TYPE B = 2 1/2" MINUS MATERIAL

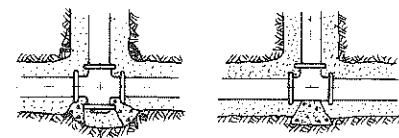


NOTE: D = DIAMETER OF PIPE

TRENCH DETAILS



THRUST BLOCK DETAILS



CITY OF ELGIN WATER SYSTEM IMPROVEMENTS PHASE I, 1,000,000 GAL. RESERVOIR	
TYPICAL WATER LINE DETAILS	
SCALE: NO SCALE	SHEET NO. 8
STEPHEN C. ANDERSON AND ASSOCIATES LA GRANDE, OREGON	
DATE: SEPT. '74	REVISED NOV 1974